

**REMARKS**

Claims 15, 18-23, 25, 37-53 and 55 are now the only claims under prosecution in this application.

The specification has been amended on page 1 to reflect the fact that USSN 09/735,779 is now U.S. Patent No. 6,352,639.

Applicants have cancelled claims 1-14, 16, 17, and 24 because they are redundant in view of the amendments presented herein.

Claim 15, 20 and 41 have been amended by clarifying some of the language as well as adding limitations with respect to a plurality of atomization fluid passageways as well as to a mixing zone containing a first inlet for feed to be atomized and a second inlet, which is a sparger, for introducing a sparger fluid. Support for these amendments can be found in Figures 1 and 3 hereof. No new matter has been added.

Applicants acknowledge that the Examiner has made the requirement for restriction final.

The specification has been objected to because USSN 09/735,779, a priority document, needed to be undated to show that it has now issued into a patent. This change has been made and applicants request that the Examiner withdraw this objection.

The title has also been objected to because it described a process and not an apparatus, as presently claimed. Applicants have provided a new title. Therefore, applicants request that this objection also be withdrawn.

**Rejection under 35 U.S.C. 102(b)**

Claims 1-3, 6-9, 13, 15, 16, 18, 39 and 40 have been rejected under 35 U.S.C. 102(b) as being anticipated by Metrailler et al. for the reasons set forth in the office action.

Applicants have cancelled claims 1-14 and have amended claims 15, 20 and 41 so that they now require a sparger as part of a mixing zone as well as requiring a plurality of atomization passageways positioned concentrically about a perimeter of the central passageway. These features are not taught by Metailer et al. Therefore, applicants request that the Examiner withdraw the rejection under 35 U.S.C. 102(b).

**First Rejection Under 35 U.S.C. 103(a)**

Claims 4, 5, 10-12, 14, 17, 19-25, 37, 38, and 41-50 have been rejected under 103(a) as being unpatentable over Metrailer et al. in view of Koveal et al. (US 6,199,768).

The Examiner argues that Metrailer et al. discloses atomization fluid passageways positioned concentrically about the perimeter of a central passageway. Applicants disagree. Metrailer et al. disclose only a single continuous atomization passageway positioned concentrically about a central passageway. The passageway of Metrailer et al. wraps 360° around a central passageway. On the contrary, the instantly claimed invention, as now amended, requires a plurality of passageways positioned concentrically around the perimeter of the central passageway. This is very different than the passageway of Metrailer et al. and one having ordinary skill in the art reading Metrailer et al., without reading the instant specification, would not be led to the instantly claimed type of passageways. Only with hindsight, which is not allowed under the patent laws, can one arrive at the novel atomization passageways of the instantly claimed invention.

The Examiner has done a thorough job analyzing the claims and comparing features of the instant with features the Examiner believes is taught in either Metrailer et al. or Koveal et al. While applicants believe they can swear behind Koveal et al. they nevertheless take the position that the instant claims, as now amended, provide a patentable invention over both Metrailer et al. and Koveal et al. alone or in combination. There is no suggestion in any of these references to provide an apparatus containing the unique plurality of atomization passageways as instantly claimed. Therefore, applicants request that this rejection be withdrawn.

**Second Rejection under 35 U.S.C. 103(a)**

Claims 51-53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Metrailler et al. in view of Koveal et al. as applied to the claims above, and King et al. (SP 5,577,668).

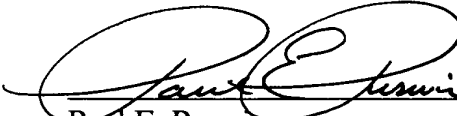
King et al. is cited as teaching a sparger that distributes flow in a radial direction, axial direction or a combination of the two for the purpose of evenly distributing the fluid. The Examiner believes that it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to have provided a sparger that allows the fluid to pass into a central passageway in a radial flow, axial flow, or both in the modified apparatus of Metrailler et al. in order to evenly distribute a fluid as taught by King et al.

King et al. teaches a fluidized spray chiller system for producing controlled release of flavoring and coloring agents. The sparger of King et al. is a manifold for distributing a gas in a vertically downward direction to flow concurrent with a product to be treated and countercurrent to a stream of uprising compressed air. The atomizing gas exits the manifold sparger the point where the product to be treated is introduced into the vessel. Also, the nozzle that introduces the product into the treating vessel does not contain any atomizing passageways. It is applicants' position that, although King et al. teach a sparger, it is used entirely different and for a different purpose than the sparger that is part of the instantly claimed invention. Furthermore, King et al. is from an entirely different art than the instantly claimed invention. King et al. relates to the food art wherein a sparger-containing chilling apparatus is used to release flavors from an encapsulated product. It is applicants' position that there would be not motivation for one looking to improve the injection of gas oils into the riser of a petroleum fluid catalytic cracking unit to look to the food art that seeks to release flavors from certain food products.

Therefore, in view of the above, and in view of amendments made to claims 15, 20 and 41, applicants request that the Examiner pass this application to allowance. The Examiner is requested to call applicants attorney should he have any questions regarding this response.

Respectfully submitted,

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**MARKED-UP VERSION OF AMENDED SPECIFICATION AND CLAIMS  
ACCOMPANYING RESPONSE TO FIRST OFFICE ACTION FOR 09/824,332**

[0001] This patent application is a continuation-in-part of U.S. patent application serial number 09/735,779 filed December 13, 2000, now U.S. Patent No. 6,635,639, which is a continuation of U.S. patent application serial number 09/383,794 filed August 26, 1999.

15. (One Amended) An apparatus for atomizing a fluid comprising:

- (a) a central passageway [comprising at least one feed inlet] for allowing a fluid to be atomized to pass therethrough;
- (b) an atomization zone positioned downstream from [the at least one feed inlet] and in fluid communication with, said central passageway;
- (c) and [at least one] a plurality of atomization fluid passageways configured to fluidly communicate with the central passageway via [an] atomization fluid passageway outlets, wherein the atomization fluid passageway outlets have a forward acute angle greater than 60° and are positioned concentrically about a perimeter of the central passageway; and
- (d) a heating zone configured to promote heat exchange between the central passageway and the [at least one] plurality of atomization fluid passageways, wherein the heating zone is positioned upstream from the atomization zone; and
- (e) a mixing zone comprising a first inlet for a fluid to be atomized and a second inlet positioned upstream of said central passageway from said atomizing fluid passageway outlets, which second inlet is a sparger which is comprised of a cylindrical conduit containing a plurality of sparger fluid passageways to allow the passage of sparger fluid into said mixing zone, and which mixing zone is in fluid communication with said central passageway.

20. (Once Amended) An apparatus for atomizing a fluid comprising:

- (a) a central passageway [comprising at least one feed inlet] for allowing a fluid to be atomized to pass therethrough;
- (b) an atomization zone positioned downstream from [the at least one feed inlet] and in fluid communication with, said central passageway;
- (c) [at least one] a plurality of atomization fluid passageways configured to fluidly communicate with the central passageway via [an] atomization fluid passageway outlets, wherein the atomization fluid passageway outlets have a forward acute angle greater than 60° and are positioned concentrically about a perimeter of the central passageway; and
- (d) a heating zone configured to promote heat exchange between the central passageway and the [at least one] plurality of atomization fluid passageways, wherein the heating zone is positioned upstream from the atomization zone; and
- (e) a steam splitter positioned within the central passageway upstream from the atomization fluid passageway outlets, and
- (f) a mixing zone comprising a first inlet for a fluid to be atomized and a second inlet positioned upstream of said central passageway from said atomizing fluid passageway outlets, which second inlet is a sparger which is comprised of a cylindrical conduit containing a plurality of sparger fluid passageways to allow the passage of sparger fluid into said mixing zone, and which mixing zone is fluid communication with said central passageway; and

wherein the central passageway has a cross-section comprising two-dimensions, wherein as at least one of the two dimensions converges in a downstream direction along at least a portion of the length of the central passageway, wherein the atomization zone has a cross-section comprising two dimensions and wherein at least one of the dimensions diverges in a downstream direction along at least a portion of the length of the atomization zone.

41. (Once Amended) A nozzle for atomizing a petroleum product comprising:

- (a) a central passageway [comprising at least one feed inlet] for allowing a fluid to be atomized to pass therethrough;
- (b) an outlet comprising an atomization zone and a spray distributor positioned downstream from and in fluid communication with, said central passageway, which spray distributor is configured to promote a predetermined spray pattern;
- (c) [at least one] a plurality of atomization fluid passageways fluidly communicating with the central passageway via [an] atomization fluid passageway outlets, wherein the atomization fluid passageway outlets have a forward acute angle greater than 60° and are positioned concentrically about a perimeter of the central passageway; and
- (d) a heating zone configured to promote heat exchange between the petroleum feed and the atomization fluid before the petroleum feed and the atomization fluid mix.



## AMENDMENT TRANSMITTAL FORM

Attorney's Docket No. MAC-0113

In re application of: Ito, Jackson I. et al.  
Serial No.: 09/824,332  
Filed: April 2, 2001  
For: Fluid Atomization Process

Before the Examiner: Rudnick, D.W..

Art Unit: 1764

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The Honorable Commissioner for Patents  
Washington, D.C. 20231

Sir:

Transmitted herewith is a(n) in the

Petition for extension of time pursuant to 37 CFR 1.136 and 1.137 is hereby made if, and to the extent, required. The fee for this extension of time is calculated to be \$ ~~0.00~~ to extend the time for filing this response until 110.- SEPT. 6, 2002

The fee for any changes in number of claims has been calculated as shown below.

CLAIMS AS AMENDED						
(1)	(2) Claims Remaining After Amendment	(3)	(4) Highest No. Previously Paid For	(5) Present Extra	(6) Rate	(7)
Total Claims	38	Minus	55	0	\$18/00	\$0
Independent Claims	4	Minus	5	0	x84.00	\$0
MULTIPLE DEPENDENT CLAIM FEE					\$280.00	\$
FEE FOR CLAIM CHANGES						\$0

The total fee for this Amendment, including claim changes and any extension of time, is calculated to be \$ ~~0.00~~ 110.-

☐ Charge \$ ~~0.00~~ to Deposit Account No. 05-1330.☒ The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 and 1.17.

20 August 2002  
Date of Signature

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## CERTIFICATE OF MAILING (37 CFR 1.8 (a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, Washington, D.C. 20231.

Peggy Pritchett

(Name of person mailing paper)

Peggy Pritchett  
(Signature of person mailing paper)

8/20/02  
(Date)

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